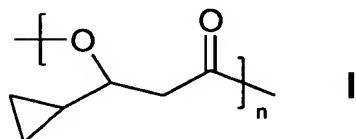


CLAIMS

We claim:

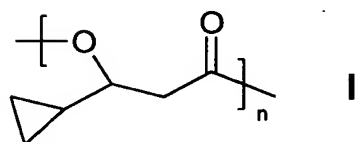
- 5 1. A composition having the formula



wherein n is greater than 1.

- 10 2. The composition of Claim 1 wherein n is about 10 to 100.

3. Process for the preparation of a composition having the formula



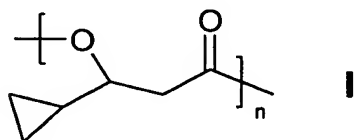
- 15 wherein n is greater than 1 which comprises reacting cyclopropane-carboxaldehyde and ketene in the presence of a catalyst selected from Lewis acids and tertiary amines.

- 20 4. Process according to Claim 3 wherein n is about 10 to 100 and cyclopropanecarboxaldehyde and ketene are reacted at a temperature of about 0 to 100°C in the presence of a catalyst wherein the catalyst is an iron carboxylate, a zinc carboxylate, a magnesium carboxylate or boron trifluoride.

5. Process according to Claim 4 wherein cyclopropanecarboxaldehyde and ketene are reacted at a temperature of about 40 to 70°C in the presence of a catalytic amount of a zinc carboxylate.

5 6. Process according to Claim 5 wherein the zinc carboxylate is zinc acetate or zinc 2-ethylhexanoate.

7. Process for the preparation of 3-cyclopropyl-3-hydroxypropionic acid which comprises contacting poly(3-cyclopropyl-3-hydroxypropionate) having
10 the formula

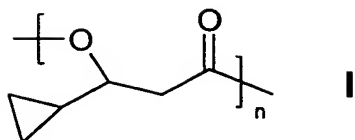


wherein n is greater than 1, with water in the presence of an acid catalyst.

15 8. Process according to Claim 7 wherein n is about 10 to 100 and the acid catalyst is a hydrogen halide, sulfuric acid, phosphoric acid or a sulfonic acid.

9. Process according to Claim 8 wherein the poly(3-cyclopropyl-3-hydroxypropionate) is contacted with water at a temperature of about 60 to
20 110°C.

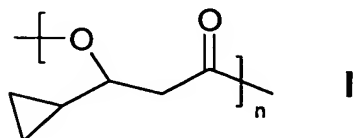
10. Process for the preparation of a metal 3-cyclopropyl-3-hydroxypropionate salt which comprises contacting poly(3-cyclopropyl-3-hydroxypropionate) having the formula
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wherein n is greater than 1, with water in the presence of a base selected from the hydroxides, carbonates, and bicarbonates of the alkali metals and alkaline earth metals.

11. Process according to Claim 10 for the preparation of a metal 3-cyclopropyl-3-hydroxypropionate salt wherein the poly(3-cyclopropyl-3-hydroxypropionate) is contacted with water in the presence of sodium or potassium hydroxide at a temperature of about 60 to 110°C.

12. Process for the preparation of an alkyl 3-cyclopropyl-3-hydroxypropionate ester which comprises contacting poly(3-cyclopropyl-3-hydroxypropionate) having the formula



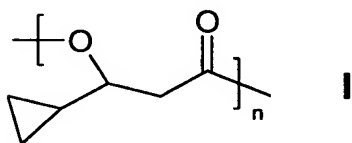
wherein n is greater than 1, with an alcohol in the presence of an acid or base catalyst.

13. Process according to Claim 12 wherein n is about 10 to 100 and the poly(3-cyclopropyl-3-hydroxypropionate) is contacted with an alcohol having the formula R^1OH wherein R^1 is an alkyl radical containing up to about 12 carbon atoms at a temperature of about 0 to 100°C in the presence of a catalytic amount of a metal alkoxide containing up to about 10 carbon

atoms wherein the metal is selected from lithium, sodium, potassium and cesium.

14. Process according to Claim 12 wherein n is about 10 to 100 and the poly(3-cyclopropyl-3-hydroxypropionate) is contacted with an alcohol having the formula R^1OH wherein R^1 is methyl, ethyl, n-propyl, n-butyl, n-pentyl or benzyl at a temperature of about 25 to 80°C in the presence of a catalytic amount of a metal alkoxide selected from the sodium and potassium alkoxides of methanol, ethanol, n-propanol, isopropanol, n-butanol, n-pentanol and benzyl alcohol.

15. Process for the preparation of 3-cyclopropyl acrylic acid which comprises heating poly(3-cyclopropyl-3-hydroxypropionate) having the formula

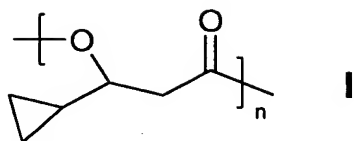


wherein n is greater than 1.

16. Process according to Claim 15 wherein n is about 10 to 100 and the heating is conducted at about 125 to 270° in the presence of an acid or base catalyst.

17. Process according to Claim 15 wherein n is about 10 to 100 and the heating is conducted at about 160 to 250° in the presence of a catalyst selected from Lewis acids and tertiary amines.

18. Process for the preparation of vinylcyclopropane which comprises heating poly(3-cyclopropyl-3-hydroxypropionate) having the formula

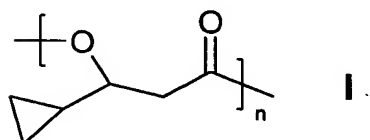


wherein n is greater than 1.

19. Process according to Claim 18 wherein n is about 10 to 100 and the heating is conducted at about 125 to 270° in the presence of an acid or base catalyst.

20. Process according to Claim 18 wherein n is about 10 to 100 and the heating is conducted at about 160 to 250° in the presence of a catalyst selected from Lewis acids and tertiary amines.

21. Process for the preparation of a mixture of 3-cyclopropylacrylic acid and vinylcyclopropane which comprises heating poly(3-cyclopropyl-3-hydroxypropionate) having the formula



wherein n is greater than 1.

22. Process according to Claim 21 wherein n is about 10 to 100 and the heating is conducted at about 125 to 270° in the presence of an acid or base catalyst.

23. Process according to Claim 21 wherein n is about 10 to 100 and the heating is conducted at about 160 to 250° in the presence of a catalyst selected from Lewis acids and tertiary amines.

24. Process for the preparation of vinylcyclopropane which comprises heating 3-cyclopropylacrylic acid at a temperature of about 100 to 300°C in the presence of an acidic catalyst.
- 5 25. Process according to Claim 24 wherein 3-cyclopropyl acrylic acid is heated at a temperature of about 150 to 250°C in the presence of an acidic catalyst selected from phosphoric acid and a zinc alkanoate.
- 10 26. Process for the preparation of vinylcyclopropane which comprises heating 3-hydroxy-3-cyclopropylpropionic acid at a temperature of about 100 to 400°C.
- 15 27. Process according to Claim 26 wherein 3-cyclopropyl-3-hydroxy--propionic acid is heated at a temperature of about 150 to 350°C.
- 20 28. Process for the preparation of vinylcyclopropane which comprises the steps of (1) contacting 3-cyclopropyl-3-hydroxypropionic acid with a C₂-C₁₄ carboxylic acid anhydride to produce a mixed anhydride of 3-cyclopropyl-3-acyloxypropionic acid; (2) contacting the anhydride from step (1) with water to form a 3-cyclopropyl-3-acyloxypropionic acid; and (3) treating the 3-cyclopropyl-3-acyloxypropionic acid from step (2) with acid, base or heat to form vinylcyclopropane.
- 25 29. Process according to Claim 28 wherein the anhydride is acetic anhydride, the 3-cyclopropyl-3-acyloxypropionic acid is 3-cyclopropyl-3-acetoxypropionic acid.
- 30 30. A mixed carboxylic anhydride comprising a 3-cyclopropyl-3-acyloxypropionyl residue and the acyl residue of a C₂-C₁₄ carboxylic acid wherein the acyloxy group is the residue of the C₂-C₁₄ carboxylic acid.

31. A mixed carboxylic anhydride according to Claim 30 comprising 3-cyclopropyl-3-acetoxypionyl residue and an acetyl residue.

5 32. Process for the preparation of 3-cyclopropyl-3-hydroxy-propionic acid which comprises contacting 3-cyclopropylacrylic acid with water in the presence of an acidic or basic catalyst.

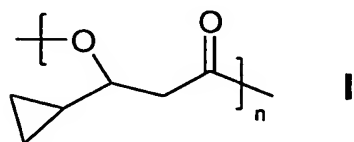
33. An alkyl 3-cyclopropyl-3-alkoxypropionate comprising methyl 3-cyclopropyl-3-methoxypropionate, ethyl 3-cyclopropyl-3-ethoxypropionate,
10 and n-propyl 3-cyclopropyl-3-n-propoxypropionate.

34. Methyl 3-cyclopropyl-3-methoxypropionate.

15 35. 3-Cyclopropyl- β -propiolactone.

36. Process for the preparation of vinylcyclopropane which comprises heating 3-cyclopropyl- β -propiolactone.

20 37. Process for the preparation of a metal salt of cyclopropylacrylic acid which comprises contacting poly(3-cyclopropyl-3-hydroxypropionate) having the formula

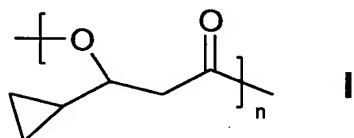


25 wherein n is greater than 1, with water in the presence of a base selected from the hydroxides, carbonates, and bicarbonates of the alkali metals and alkaline earth metals.

38. Process according to claim 37 for the preparation of a metal salt of cyclopropylacrylic acid where in the poly(3-cyclopropyl-3-hydroxypropionate is contacted with water in the presence of sodium or potassium hydroxide at a temperature of about 60 to 110 C.

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39. Process for the preparation of trans-3-cyclopropylacrylic acid which comprises the steps of 1) contacting poly(3-cyclopropyl-3-hydroxypropionate) having the formula



10

wherein n is greater than 1, with water in the presence of a base selected from the hydroxides, carbonates, and bicarbonates of the alkali metals and alkaline earth metals and 2) neutralization of the solution resulting from step one with an acid selected from hydrogen halide, sulfuric acid, phosphoric acid or a sulfonic acid and 3) isolation of the formed solid trans-3-cyclopropylacrylic acid by filtration.

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40. Process according to claim 39 wherein the base used in step 1 is sodium or potassium hydroxide and wherein the acid used in step 2 is hydrochloric acid.

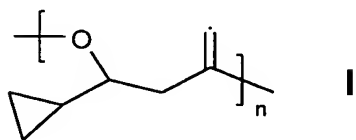
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41. Process according to claim 40 wherein the base used in step one is sodium hydroxide in a feed concentration greater than 25 weight % and wherein the acid used in step 2 is at a feed concentration greater than 10 weight percent hydrogen chloride.

25

42. Process for the preparation of a mixture of a metal salt of cyclopropylacrylic acid and a metal salt of 3-cyclopropyl-3-hydroxypropionic

acid which comprises contacting poly(3-cyclopropyl-3-hydroxypropionate) having the formula



5 wherein n is greater than 1, with water in the presence of a base selected from the hydroxides, carbonates, and bicarbonates of the alkali metals and alkaline earth metals.

10 43. A process according to claim 7 which involves an additional step for the preparation of methylcyclopropylketone by oxidation of 3-cyclopropyl-3-hydroxypropionic acid.

15 44. A process for the preparation of alkyl 3-keto-3-cyclopropylpropionic esters by oxidation of 3-alkyl 3-cyclopropyl-3-hydroxypropionate esters prepared according to claim 12.

20 45. A process according to claim 44 wherein the alkyl 3-keto-3-cyclopropylpropionate ester is methyl 3-cyclopropyl-3-oxopropionate.